



Air Force Research Laboratory | AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

AFRL VALIDATES NEW SMOKE MEASUREMENT SYSTEM



AFRL successfully validated its Turbine Engine Smoke Measurement System through comparison testing with similar smoke measurement systems. Scientists field-tested the system at various throttle settings to measure turbine engine emissions. The validation of the AFRL Turbine Engine Smoke Measurement System supports pollutant emissions test practices that AFRL scientists use both for development purposes and for Joint Strike Fighter (JSF) full-engine emissions testing.



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Accomplishment

AFRL, the Arnold Engineering Development Center, Middle Tennessee State University, the University of Dayton Research Institute, and program support contractors jointly conducted this turbine engine emissions testing. Scientists obtained smoke samples from a CFM56 combustor, which operates at AFRL's High-Pressure Combustion Research Facility and in J-12 aircraft engine field tests at Middle Tennessee State University, Murfreesboro, Tennessee. Quantification of gaseous and particle emissions may influence the placement of the JSF throughout the US. Levels of emitted engine particulates may restrict the JSF aircraft from some locations due to environmental considerations.

Background

AFRL sets component goals for engine demonstrations to meet specific advanced Air Force missions. The laboratory explores and evaluates novel propulsion concepts critical to meeting future needs, while enhancing component capabilities through the understanding and innovative use of chemistry, aerodynamics, heat transfer, materials, diagnostics, computational fluid dynamics, and design tools.

Propulsion
Emerging Technologies

Additional Information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (05-PR-16)